



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/576,658	04/20/2006	Toshifumi Kawamura	4700.P0329US	5732
23474 7590 10/29/2009 FLYNN THIEL BOUTELL & TANIS, P.C. 2026 RAMBLING ROAD KALAMAZOO, MI 49008-1631				
EXAMINER BAREFORD, KATHERINE A				
ART UNIT 1792		PAPER NUMBER		
MAIL DATE 10/29/2009		DELIVERY MODE PAPER		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/576,658

Applicant(s)

KAWAMURA ET AL.

Examiner

Katherine A. Bareford

Art Unit

1792

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 August 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 2 and 5-13 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 2 and 5-13 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/CDC)
- 4) ☐ Interview Summary (PTO-413)
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____
- Paper No(s)/Mail Date _____

DETAILED ACTION

1. The amendment of August 21, 2009 has been received and entered. With the entry of the amendment, claims 1, 3 and 4 are canceled, and claims 2 and 5-13 (including new claims 5-13) are pending for examination.

Specification

2. The substitute specification provided August 21, 2009 is approved.

Claim Objections

3. The objections to claims 1 and 3 are withdrawn due to the cancellation of claims 1 and 3 in the amendment of August 21, 2009.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were

made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claims 2, 5, 12 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Japan 2000-204479 (hereinafter '479) in view of Korea 2000-0076067 (hereinafter '067), and optionally, further in view of EITHER Mardilovich et al (US 2005/0006339) OR Furusawa (US 2002/0151171).

'479 teaches that it is known to draw a wiring pattern on a on a substrate. Paragraphs [0001]—[0002], [0009] and [0044]--[0047]. The process includes drawing the desired metal wiring pattern on a substrate by an inkjet process, where a composition containing a silane coupling agent is applied to the substrate in a pattern. Paragraph [0044]. The substrate with the coated silane coupling agent is immersed in activator solution. Paragraphs [0045] and [0026]-[0027] (using palladium chloride system, for example, to activate for chemical plating.). Then chemical plating of the substrate with a metal occurs. Paragraph [0046]. The composition of silane is in a solution to be plated by the ink jet printer, thus forming an "ink" of the composition. See paragraph [0044] (composition in an "ink tank"). '479 teaches that an amino-based silane is used, but that other silane coupling agents can be used as well. Paragraph [0023]. The silane coupling agent can be 0.3 wt% of the ink. Paragraph [0044].

'479 teaches all the features of these claims except that (1) an azole-based silane coupling agent, such as imidazole-silane, is used, and the amount used in g/L and (2) that electroless plating is performed over the substrate (claim 4) as the "chemical plating".

However, '067 teaches providing a silane based coupling agent composition on a substrate, followed by treatment with a noble metal (such as palladium ion) solution as an activator solution to prepare the substrate for plating, followed by chemical plating, including electroless plating, to provide a metal coating (abstract and page 4, second, third and fourth full paragraphs of the translation). '067 teaches that the silane coupling agent is desirably in the form of an azole-based silane coupling agent, such as an imidazolesilane, from the reaction of the silane and an imidazole (see abstract and page 3 of the translation). This silane based coupling agent can desirably be dissolved in a desirable solvent such as water as compared to an amino-silane (see page 2, background art section, and paragraphs bridging pages 3-4 of the translation); and the use of the imidazolesilane gives a better plating coverage than the azole silane (see comparative Example 6, page 7 of the translation). The amount of silane coupling agent used can be 0.001-10 wt% (page 4, first full paragraph of the translation). The azole based silane coupling agent can be a reaction product of imidazole and γ -glycidoxypolytrimethoxysilane, for example (page 9, Embodiment 10).

Mardilovich teaches that ink jet can be used in electroless plating processes for applying an electroless active layer and electroless plating layers (paragraphs [0005],

[0020]). Mardilovich also teaches that when providing such materials by ink jetting, the compositions to be applied can conventionally contain those typically used in ink jet liquid vehicles, including solvents, cosolvents, surfactants, viscosity modifiers, etc, with the viscosity and surface tension controlled to that appropriate for various ink jetting conditions using viscosity modifiers and surface tension adjusting compounds. Paragraph [0038].

Furusawa teaches that it is well known to apply liquids containing fine metal particles, for example, by ink jet printing of compositions, and that ink jet printing compositions are conventionally adjusted to have a viscosity and surface tension suitable for ink jet ejection by adding a proper solvent or surface tension regulator. Paragraphs [0069] – [0070].

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify '479 to use an azole-based silane, such as an imidazolesilane, as the silane coupling agent as suggested by '067 with an expectation of desirable activation results, as '479 teaches to use a silane based coupling agent, exemplifying but not limited to amino-based silane coupling agents, and '067 teaches that when using silane based coupling agents for a similar plating process it is desirable to use an azole-based silane, such as an imidazolesilane, as the silane coupling agent instead for better dissolvability. It would further have been obvious to modify '479 to provide the chemical plating in the form of electroless plating as suggested by '067 to provide a desirable plating on the substrate, because '479 teaches to provide chemical

plating of metal over the silane coupling agent layer and activator layer, and '067 teaches that when performing chemical plating of metal over a silane coupling agent layer and activator layer, it is desirable to provide the chemical plating in the form of electroless plating.

As to the use of 0.01 to 100 g/L of azole-based silane, '067 teaches to use 0.001 to 10 wt% silane as part of the solution (composition), which would, when converted to g/L of the solution overlap with the claimed amount of silane coupling agent, and In the case where the claimed ranges "overlap or lie inside ranges disclosed by the prior art" a prima facie case of obviousness exists. In re Wertheim, 541 F.2d 257, 191 USPQ 90 (CCPA 1976). Furthermore, one of ordinary skill in the art would, when optimizing the amount of silane used from the range given, take into account the use of the material in the ink jet process of '479 in view of '067 to provide an amount under conditions such as viscosity to allow ink jet printing, as shown from the amount of material used as a silane coupling agent in '479 with a controlled viscosity (see paragraph [0044]).

Moreover, optionally, the Examiner further notes that it would also have been suggested to optimize the amount of silane coupling agent used in the ink jet process of '479 in view of '067 as part of the process of providing a controlled viscosity ink jet printing composition as suggested by EITHER Mardilovich OR Furusawa because '479 shows providing a controlled viscosity and amount of material for ink jet printing (see paragraph [0044]) and both Mardilovich and Furusawa show the controlling of viscosity and surface tension conditions to provide proper conditions for ink jet

printing, and amount of silane material will obviously affect those conditions by adding an extra material into the composition.

7. Claims 6-7 and 9-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over '479 in view of '067, and optionally, further in view of EITHER Mardilovich OR Furusawa as applied to claims 2, 5, 12 and 13 above, and further in view of Imori (US 2002/0192379).

'479 in view of '067, and optionally, further in view of EITHER Mardilovich OR Furusawa teaches all the features of these claims except that the electroless plating activator is in the ink (claim 6) and its concentration (claim 7). '479 indicates that electroless plating activators are desirably noble metal compounds such as palladium compounds, as in claims 9-10 (see paragraphs [0026]--[0027]). '067 teaches that the azole based silane coupling agent can be a reaction product of imidazole and γ -glycidoxypolytrimethoxysilane, for example (page 9, Embodiment 10).

Imori teaches that when pretreating a substrate before electroless plating, it is desirable to provide that the metal pretreatment agent uses a silane coupling agent that has a metal-capturing functional group; and where the silane coupling agent has captured a metal; and then applying the pretreatment agent to a substrate to be followed by electroless plating. Paragraph [0006]. The metal that has been captured is desirably a precious metal compound that acts as a high activity catalyst (electroless activator), such as palladium chloride. Paragraphs [0009], [0017]. The metal compound

is captured by mixing solutions of the respective compounds. Paragraph [0017]. The amount of silane coupling agent to be used is desirably 0.001 to 10 wt%. Paragraph [0025]. The amount of electroless plating activator can be 100 mg/L (0.1 g/L). Paragraph [0037]. The silane coupling agent can be a reaction product of imidazole and γ -glycidoxypolytrimethoxysilane, for example. Paragraph [0037].

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify '479 in view of '067, and optionally, further in view of EITHER Mardilovich OR Furusawa to provide that the electroless plating activator is actually contained within the ink composition as suggested by Imori, in order to provide a desirably activated surface, because '479 in view of '067, and optionally, further in view of EITHER Mardilovich OR Furusawa teaches ink jet printing an azole-based silane coupling agent containing composition followed by applying electroless activator before electroless plating, and Imori teaches that when providing an azole-based silane coupling agent containing composition before electroless plating, the electroless activator in the form of palladium chloride can desirably and efficiently be included with the azole-based silane coupling agent containing composition, in an amount of 0.1 g/L (within the claimed range), including with a silane coupling agent that is a reaction product of imidazole and γ -glycidoxypolytrimethoxysilane.

8. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over '479 in view of '067, and further in view of Imori as applied to claims 6-7 and 9-11 above, and further in view of EITHER Mardilovich OR Furusawa.

'479 in view of '067, and further in view of Imori, teaches all the features of these claims except the viscosity adjuster and surface tension adjuster in the ink composition.

Mardilovich teaches that ink jet can be used in electroless plating processes for applying an electroless active layer and electroless plating layers (paragraphs [0005], [0020]). Mardilovich also teaches that when providing such materials by ink jetting, the compositions to be applied can conventionally contain those typically used in ink jet liquid vehicles, including solvents, cosolvents, surfactants, viscosity modifiers, etc, with the viscosity and surface tension controlled to that appropriate for various ink jetting conditions using viscosity modifiers and surface tension adjusting compounds. Paragraph [0038].

Furusawa teaches that it is well known to apply liquids containing fine metal particles, for example, by ink jet printing of compositions, and that ink jet printing compositions are conventionally adjusted to have a viscosity and surface tension suitable for ink jet ejection by adding a proper solvent or surface tension regulator. Paragraphs [0069] – [0070].

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify '479 in view of '067, further in view of Imori to provide that the ink composition contains a viscosity adjuster and surface tension adjuster as

suggested by EITHER Mardilovich OR Furusawa, in order to provide a desirable ink composition for ink jet printing, as '479 in view of '067, further in view of Imori teaches ink jet printing an azole-based silane coupling agent containing composition followed by electroless plating and both Mardilovich and Furusawa show the controlling of viscosity and surface tension conditions using viscosity and surface tension adjusters in ink compositions to provide proper conditions for ink jet printing.

Double Patenting

9. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

10. Claims 2 and 5-12 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-14 of U.S. Patent No. 6,780,467

(‘467) in view of Japan 2000-204479 (hereinafter ‘479) and Korea 2000-0076067 (hereinafter ‘067).

The claims of ‘467 provide a teaching of a method of electroless plating where an azole-based silane coupling agent, such as an imidazole-silane, containing material is applied to a substrate followed by electroless plating (claims 1, 3) and a pretreatment agent (composition) with the azole-based silane coupling agent is also provided (claims 9-11). ‘467 does not provide that the composition is an inkjet printing ink, applied by inkjet printing to form a wiring pattern; but ‘479 provides that it is known to draw a wiring pattern on a on a substrate. Paragraphs [0001] – [0002], [0009] and [0044]–[0047]. The process includes drawing the desired metal wiring pattern on a substrate by an inkjet process, where a composition containing a silane coupling agent is applied to the substrate in a pattern. Paragraph [0044]. The substrate with the coated silane coupling agent is immersed in activator solution. Paragraphs [0045] and [0026]-[0027] (using palladium chloride system, for example, to activate for chemical plating.). Then chemical plating of the substrate with a metal occurs. Paragraph [0046]. The composition of silane is in a solution to be plated by the ink jet printer, thus forming an “ink” of the composition. See paragraph [0044] (composition in an “ink tank”). ‘479 teaches that an amino-based silane is used, but that other silane coupling agents can be used as well. Paragraph [0023]. It would have been obvious to modify ‘467 to provide that the silane based coupling agent is provided in the form of an ink jet ink and applied to form a wiring pattern by inkjet printing to allow for desirable use of the

material when forming metal wiring patterns as described by '479 as being a desirable use for silane coupling agents applied as a pretreatment before metal overplating. '467 further does not provide the amount of silane coupling agent in the composition. However, '067 teaches providing a silane based coupling agent composition on a substrate, followed by treatment with a noble metal (such as palladium ion) solution as an activator solution to prepare the substrate for plating, followed by chemical plating, including electroless plating, to provide a metal coating (abstract and page 4, second, third and fourth full paragraphs of the translation). '067 teaches that the silane coupling agent is desirably in the form of an azole-based silane coupling agent, such as an imidazolesilane, from the reaction of the silane and an imidazole (see abstract and page 3 of the translation). This silane based coupling agent can desirably be dissolved in a desirable solvent such as water as compared to an amino-silane (see page 2, background art section, and paragraphs bridging pages 3-4 of the translation); and the use of the imidazolesilane gives a better plating coverage than the azole silane (see comparative Example 6, page 7 of the translation). The amount of silane coupling agent used can be 0.001-10 wt% (page 4, first full paragraph of the translation). The azole based silane coupling agent can be a reaction product of imidazole and γ -glycidoxypolytrimethoxysilane, for example (page 9, Embodiment 10). It would have been obvious to modify '467 in view of '479 to use the claimed amount of silane, as '067 teaches to use 0.001 to 10 wt% silane as part of the solution (composition) that uses azole-based silanes as described by '467, which would, when converted to g/L of the

solution overlap with the claimed amount of silane coupling agent, and In the case where the claimed ranges “overlap or lie inside ranges disclosed by the prior art” a prima facie case of obviousness exists. In re Wertheim, 541 F.2d 257, 191 USPQ 90 (CCPA 1976). Furthermore, one of ordinary skill in the art would when optimizing the amount of silane used from the range given take into account the use of the material in the ink jet process of '467 in view of '479 and '067 to provide an amount under conditions such as viscosity to allow ink jet printing, as shown from the amount of material used as a silane coupling agent in '479 with a controlled viscosity (see paragraph [0044]). As to claims 6-7 and 9-10, '467 teaches to provide the palladium compound activator in the solution, and as to the amount of activator, Generally, differences in concentration or temperature will not support the patentability of subject matter encompassed by the prior art unless there is evidence indicating such concentration or temperature is critical. “[W]here the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation.” In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955), and as to the use of palladium chloride, the Examiner takes Official Notice that this is a conventional palladium compound for activation. As to claim 8, the Examiner takes Official Notice that it is conventional to provide viscosity adjusters and surface tension adjusters in ink jet inks. As to claim 11, '067 provides the reaction product.

11. Claims 2 and 5-12 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-11 of U.S. Patent No. 7,045,461 ('461) in view of Japan 2000-204479 (hereinafter '479) and Korea 2000-0076067 (hereinafter '067).

The claims of '461 provide a teaching of a method of electroless plating where an azole-based silane coupling agent, such as an imidazole-silane, containing material is applied to a substrate followed by electroless plating (claims 1) and a pretreatment agent (composition) with the azole-based silane coupling agent is also provided (claim 9). '461 does not provide that the composition is an inkjet printing ink, applied by inkjet printing to form a wiring pattern; but '479 provides that it is known to draw a wiring pattern on a on a substrate. Paragraphs [0001]—[0002], [0009] and [0044]—[0047]. The process includes drawing the desired metal wiring pattern on a substrate by an inkjet process, where a composition containing a silane coupling agent is applied to the substrate in a pattern. Paragraph [0044]. The substrate with the coated silane coupling agent is immersed in activator solution. Paragraphs [0045] and [0026]–[0027] (using palladium chloride system, for example, to activate for chemical plating.). Then chemical plating of the substrate with a metal occurs. Paragraph [0046]. The composition of silane is in a solution to be plated by the ink jet printer, thus forming an “ink” of the composition. See paragraph [0044] (composition in an “ink tank”). '479 teaches that an amino-based silane is used, but that other silane coupling agents can be used as well. Paragraph [0023]. It would have been obvious to modify '461 to provide

that the silane based coupling agent is provided in the form of an ink jet ink and applied to form a wiring pattern by inkjet printing to allow for desirable use of the material when forming metal wiring patterns as described by '479 as being a desirable use for silane coupling agents applied as a pretreatment before metal overplating. '461 further does not provide the amount of silane coupling agent in the composition. However, '067 teaches providing a silane based coupling agent composition on a substrate, followed by treatment with a noble metal (such as palladium ion) solution as an activator solution to prepare the substrate for plating, followed by chemical plating, including electroless plating, to provide a metal coating (abstract and page 4, second, third and fourth full paragraphs of the translation). '067 teaches that the silane coupling agent is desirably in the form of an azole-based silane coupling agent, such as an imidazolesilane, from the reaction of the silane and an imidazole (see abstract and page 3 of the translation). This silane based coupling agent can desirably be dissolved in a desirable solvent such as water as compared to an amino-silane (see page 2, background art section, and paragraphs bridging pages 3-4 of the translation); and the use of the imidazolesilane gives a better plating coverage than the azole silane (see comparative Example 6, page 7 of the translation). The amount of silane coupling agent used can be 0.001-10 wt% (page 4, first full paragraph of the translation). The azole based silane coupling agent can be a reaction product of imidazole and γ -glycidoxypolytrimethoxysilane, for example (page 9, Embodiment 10). It would have been obvious to modify '461 in view of '479 to use the claimed amount of silane, as '067

teaches to use 0.001 to 10 wt% silane as part of the solution (composition) that uses azole-based silanes as described by '461, which would, when converted to g/L of the solution overlap with the claimed amount of silane coupling agent, and In the case where the claimed ranges "overlap or lie inside ranges disclosed by the prior art" a prima facie case of obviousness exists. In re Wertheim, 541 F.2d 257, 191 USPQ 90 (CCPA 1976). Furthermore, one of ordinary skill in the art would when optimizing the amount of silane used from the range given take into account the use of the material in the ink jet process of '461 in view of '479 and '067 to provide an amount under conditions such as viscosity to allow ink jet printing, as shown from the amount of material used as a silane coupling agent in '479 with a controlled viscosity (see paragraph [0044]). As to claims 6-7 and 9-10, '461 teaches to provide the palladium compound activator in the solution, and as to the amount of activator, Generally, differences in concentration or temperature will not support the patentability of subject matter encompassed by the prior art unless there is evidence indicating such concentration or temperature is critical. "[W]here the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation." In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955), and as to the use of palladium chloride, the Examiner takes Official Notice that this is a conventional palladium compound for activation. As to claim 8, the Examiner takes Official Notice that it is conventional to provide viscosity adjusters and surface tension adjusters in ink jet inks. As to claim 11, '461 provides the reaction product.

12. Claims 5, 12 and 13 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-14 of U.S. Patent No. 7,179,741 ('741) in view of Japan 2000-204479 (hereinafter '479) and Korea 2000-0076067 (hereinafter '067).

The claims of '741 provide a teaching of a method of electroless plating where an azole-based silane coupling agent, such as an imidazole-silane, containing material is applied to a substrate, followed by coating with palladium compound (activator), followed by electroless plating (claims 1, 7) and a pretreatment agent (composition) with the azole-based silane coupling agent is also provided (from the composition described in the process of claims 1, 7). '741 does not provide that the composition is an inkjet printing ink, applied by inkjet printing to form a wiring pattern; but '479 provides that it is known to draw a wiring pattern on a substrate. Paragraphs [0001]–[0002], [0009] and [0044]–[0047]. The process includes drawing the desired metal wiring pattern on a substrate by an inkjet process, where a composition containing a silane coupling agent is applied to the substrate in a pattern. Paragraph [0044]. The substrate with the coated silane coupling agent is immersed in activator solution. Paragraphs [0045] and [0026]–[0027] (using palladium chloride system, for example, to activate for chemical plating.). Then chemical plating of the substrate with a metal occurs. Paragraph [0046]. The composition of silane is in a solution to be plated by the ink jet printer, thus forming an “ink” of the composition. See paragraph [0044] (composition

in an "ink tank"). '479 teaches that an amino-based silane is used, but that other silane coupling agents can be used as well. Paragraph [0023]. It would have been obvious to modify '741 to provide that the silane based coupling agent is provided in the form of an ink jet ink and applied to form a wiring pattern by inkjet printing to allow for desirable use of the material when forming metal wiring patterns as described by '479 as being a desirable use for silane coupling agents applied as a pretreatment before metal overplating. '741 further does not provide the amount of silane coupling agent in the composition. However, '067 teaches providing a silane based coupling agent composition on a substrate, followed by treatment with a noble metal (such as palladium ion) solution as an activator solution to prepare the substrate for plating, followed by chemical plating, including electroless plating, to provide a metal coating (abstract and page 4, second, third and fourth full paragraphs of the translation). '067 teaches that the silane coupling agent is desirably in the form of an azole-based silane coupling agent, such as an imidazolesilane, from the reaction of the silane and an imidazole (see abstract and page 3 of the translation). This silane based coupling agent can desirably be dissolved in a desirable solvent such as water as compared to an amino-silane (see page 2, background art section, and paragraphs bridging pages 3-4 of the translation); and the use of the imidazolesilane gives a better plating coverage than the azole silane (see comparative Example 6, page 7 of the translation). The amount of silane coupling agent used can be 0.001-10 wt% (page 4, first full paragraph of the translation). The azole based silane coupling agent can be a reaction product of

imidazole and γ -glycidoxypolytrimethoxysilane, for example (page 9, Embodiment 10). It would have been obvious to modify '741 in view of '479 to use the claimed amount of silane, as '067 teaches to use 0.001 to 10 wt% silane as part of the solution (composition) that uses azole-based silanes as described by '741, which would, when converted to g/L of the solution overlap with the claimed amount of silane coupling agent, and In the case where the claimed ranges "overlap or lie inside ranges disclosed by the prior art" a prima facie case of obviousness exists. In re Wertheim, 541 F.2d 257, 191 USPQ 90 (CCPA 1976). Furthermore, one of ordinary skill in the art would when optimizing the amount of silane used from the range given take into account the use of the material in the ink jet process of '741 in view of '479 and '067 to provide an amount under conditions such as viscosity to allow ink jet printing, as shown from the amount of material used as a silane coupling agent in '479 with a controlled viscosity (see paragraph [0044]).

13. Claims 2 and 5-13 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 4-15 of copending Application No. 10/558,172 ('172) in view of Japan 2000-204479 (hereinafter '479) and Korea 2000-0076067 (hereinafter '067).

The claims of '172 provide a teaching of a method of electroless plating where an azole-based silane coupling agent, such as an imidazole-silane, containing material is applied to a substrate, followed by coating with palladium compound (activator),

followed by electroless plating (claims 1, 3, 4, 5) and a pretreatment agent (composition) with the azole-based silane coupling agent is also provided (from the composition described in the process of claims 1, 3, 4, 5). '172 does not provide that the composition is an inkjet printing ink, applied by inkjet printing to form a wiring pattern; but '479 provides that it is known to draw a wiring pattern on a on a substrate. Paragraphs [0001] – [0002], [0009] and [0044]–[0047]. The process includes drawing the desired metal wiring pattern on a substrate by an inkjet process, where a composition containing a silane coupling agent is applied to the substrate in a pattern. Paragraph [0044]. The substrate with the coated silane coupling agent is immersed in activator solution. Paragraphs [0045] and [0026]–[0027] (using palladium chloride system, for example, to activate for chemical plating.). Then chemical plating of the substrate with a metal occurs. Paragraph [0046]. The composition of silane is in a solution to be plated by the ink jet printer, thus forming an “ink” of the composition. See paragraph [0044] (composition in an “ink tank”). '479 teaches that an amino-based silane is used, but that other silane coupling agents can be used as well. Paragraph [0023]. It would have been obvious to modify '172 to provide that the silane based coupling agent is provided in the form of an ink jet ink and applied to form a wiring pattern by inkjet printing to allow for desirable use of the material when forming metal wiring patterns as described by '479 as being a desirable use for silane coupling agents applied as a pretreatment before metal overplating. '172 further does not provide the amount of silane coupling agent in the composition. However, '067 teaches providing a silane based coupling

agent composition on a substrate, followed by treatment with a noble metal (such as palladium ion) solution as an activator solution to prepare the substrate for plating, followed by chemical plating, including electroless plating, to provide a metal coating (abstract and page 4, second, third and fourth full paragraphs of the translation). '067 teaches that the silane coupling agent is desirably in the form of an azole-based silane coupling agent, such as an imidazolesilane, from the reaction of the silane and an imidazole (see abstract and page 3 of the translation). This silane based coupling agent can desirably be dissolved in a desirable solvent such as water as compared to an amino-silane (see page 2, background art section, and paragraphs bridging pages 3-4 of the translation); and the use of the imidazolesilane gives a better plating coverage than the azole silane (see comparative Example 6, page 7 of the translation). The amount of silane coupling agent used can be 0.001-10 wt% (page 4, first full paragraph of the translation). The azole based silane coupling agent can be a reaction product of imidazole and γ -glycidoxypolytrimethoxysilane, for example (page 9, Embodiment 10). It would have been obvious to modify '172 in view of '479 to use the claimed amount of silane, as '067 teaches to use 0.001 to 10 wt% silane as part of the solution (composition) that uses azole-based silanes as described by '172, which would, when converted to g/L of the solution overlap with the claimed amount of silane coupling agent, and In the case where the claimed ranges "overlap or lie inside ranges disclosed by the prior art" a prima facie case of obviousness exists. In re Wertheim, 541 F.2d 257, 191 USPQ 90 (CCPA 1976). Furthermore, one of ordinary skill in the art would when

optimizing the amount of silane used from the range given take into account the use of the material in the ink jet process of '172 in view of '479 and '067 to provide an amount under conditions such as viscosity to allow ink jet printing, as shown from the amount of material used as a silane coupling agent in '479 with a controlled viscosity (see paragraph [0044]). As to claims 6-7 and 9-10, '172 teaches to provide the palladium compound activator in the solution, and as to the amount of activator, Generally, differences in concentration or temperature will not support the patentability of subject matter encompassed by the prior art unless there is evidence indicating such concentration or temperature is critical. "[W]here the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation." In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955), and as to the use of palladium chloride, the Examiner takes Official Notice that this is a conventional palladium compound for activation. As to claim 8, the Examiner takes Official Notice that it is conventional to provide viscosity adjusters and surface tension adjusters in ink jet inks. As to claim 11, '067 provides the reaction product.

This is a provisional obviousness-type double patenting rejection.

14. Claims 2 and 5-12 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-10 of copending Application No. 10/586,379 ('379) in view of Japan 2000-204479 (hereinafter '479) and Korea 2000-0076067 (hereinafter '067).

The claims of '379 provide a teaching of a method of electroless plating where an azole-based silane coupling agent, such as an imidazole-silane, containing material is applied to a substrate by inkjet application, followed by electroless plating (claims 1-4 and 7-9) and a ink composition with the azole-based silane coupling agent is also provided (from the composition described in the process of claims 1-4 and 7). '379 does not provide that the composition is an inkjet printing ink, applied by inkjet printing to form a wiring pattern; but '479 provides that it is known to draw a wiring pattern on a substrate. Paragraphs [0001] – [0002], [0009] and [0044]–[0047]. The process includes drawing the desired metal wiring pattern on a substrate by an inkjet process, where a composition containing a silane coupling agent is applied to the substrate in a pattern. Paragraph [0044]. The substrate with the coated silane coupling agent is immersed in activator solution. Paragraphs [0045] and [0026]–[0027] (using palladium chloride system, for example, to activate for chemical plating.). Then chemical plating of the substrate with a metal occurs. Paragraph [0046]. The composition of silane is in a solution to be plated by the ink jet printer, thus forming an “ink” of the composition. See paragraph [0044] (composition in an “ink tank”). '479 teaches that an amino-based silane is used, but that other silane coupling agents can be used as well. Paragraph [0023]. It would have been obvious to modify '379 to provide that the silane based coupling agent is provided in the form of an ink jet ink and applied to form a wiring pattern by inkjet printing to allow for desirable use of the material when forming metal wiring patterns as described by '479 as being a desirable use for silane coupling agents

applied as a pretreatment before metal overplating. '379 further does not provide the amount of silane coupling agent in the composition. However, '067 teaches providing a silane based coupling agent composition on a substrate, followed by treatment with a noble metal (such as palladium ion) solution as an activator solution to prepare the substrate for plating, followed by chemical plating, including electroless plating, to provide a metal coating (abstract and page 4, second, third and fourth full paragraphs of the translation). '067 teaches that the silane coupling agent is desirably in the form of an azole-based silane coupling agent, such as an imidazolesilane, from the reaction of the silane and an imidazole (see abstract and page 3 of the translation). This silane based coupling agent can desirably be dissolved in a desirable solvent such as water as compared to an amino-silane (see page 2, background art section, and paragraphs bridging pages 3-4 of the translation); and the use of the imidazolesilane gives a better plating coverage than the azole silane (see comparative Example 6, page 7 of the translation). The amount of silane coupling agent used can be 0.001-10 wt% (page 4, first full paragraph of the translation). The azole based silane coupling agent can be a reaction product of imidazole and γ -glycidoxypropytrimethoxysilane, for example (page 9, Embodiment 10). It would have been obvious to modify '379 in view of '479 to use the claimed amount of silane, as '067 teaches to use 0.001 to 10 wt% silane as part of the solution (composition) that uses azole-based silanes as described by '379, which would, when converted to g/L of the solution overlap with the claimed amount of silane coupling agent, and In the case where the claimed ranges "overlap or lie inside

ranges disclosed by the prior art” a prima facie case of obviousness exists. In re Wertheim, 541 F.2d 257, 191 USPQ 90 (CCPA 1976). Furthermore, one of ordinary skill in the art would when optimizing the amount of silane used from the range given take into account the use of the material in the ink jet process of ‘379 in view of ‘479 and ‘067 to provide an amount under conditions such as viscosity to allow ink jet printing, as shown from the amount of material used as a silane coupling agent in ‘479 with a controlled viscosity (see paragraph [0044]). As to claims 6-7 and 9-10, ‘379 teaches to provide the palladium compound activator in the solution, and as to the amount of activator, Generally, differences in concentration or temperature will not support the patentability of subject matter encompassed by the prior art unless there is evidence indicating such concentration or temperature is critical. “[W]here the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation.” In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955), and as to the use of palladium chloride, the Examiner takes Official Notice that this is a conventional palladium compound for activation. As to claim 8, the Examiner takes Official Notice that it is conventional to provide viscosity adjusters and surface tension adjusters in ink jet inks. As to claim 11, ‘067 provides the reaction product.

This is a provisional obviousness-type double patenting rejection.

15. Claims 2 and 5-12 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-11 of copending Application No. 11/795,355 ('355) in view of Japan 2000-204479 (hereinafter '479) and Korea 2000-0076067 (hereinafter '067).

The claims of '355 provide a teaching of a method of electroless plating where an azole-based silane coupling agent, such as an imidazole-silane, containing material is applied to a substrate, followed by electroless plating (claim 7) and a pretreatment agent (composition) with the azole-based silane coupling agent is also provided (from the composition described in the process of claim 7). '355 does not provide that the composition is an inkjet printing ink, applied by inkjet printing to form a wiring pattern; but '479 provides that it is known to draw a wiring pattern on a substrate. Paragraphs [0001] – [0002], [0009] and [0044]–[0047]. The process includes drawing the desired metal wiring pattern on a substrate by an inkjet process, where a composition containing a silane coupling agent is applied to the substrate in a pattern. Paragraph [0044]. The substrate with the coated silane coupling agent is immersed in activator solution. Paragraphs [0045] and [0026]–[0027] (using palladium chloride system, for example, to activate for chemical plating.). Then chemical plating of the substrate with a metal occurs. Paragraph [0046]. The composition of silane is in a solution to be plated by the ink jet printer, thus forming an "ink" of the composition. See paragraph [0044] (composition in an "ink tank"). '479 teaches that an amino-based silane is used, but that other silane coupling agents can be used as well. Paragraph [0023]. It would have been

obvious to modify '355 to provide that the silane based coupling agent is provided in the form of an ink jet ink and applied to form a wiring pattern by inkjet printing to allow for desirable use of the material when forming metal wiring patterns as described by '479 as being a desirable use for silane coupling agents applied as a pretreatment before metal overplating. '355 further does not provide the amount of silane coupling agent in the composition. However, '067 teaches providing a silane based coupling agent composition on a substrate, followed by treatment with a noble metal (such as palladium ion) solution as an activator solution to prepare the substrate for plating, followed by chemical plating, including electroless plating, to provide a metal coating (abstract and page 4, second, third and fourth full paragraphs of the translation). '067 teaches that the silane coupling agent is desirably in the form of an azole-based silane coupling agent, such as an imidazolesilane, from the reaction of the silane and an imidazole (see abstract and page 3 of the translation). This silane based coupling agent can desirably be dissolved in a desirable solvent such as water as compared to an amino-silane (see page 2, background art section, and paragraphs bridging pages 3-4 of the translation); and the use of the imidazolesilane gives a better plating coverage than the azole silane (see comparative Example 6, page 7 of the translation). The amount of silane coupling agent used can be 0.001-10 wt% (page 4, first full paragraph of the translation). The azole based silane coupling agent can be a reaction product of imidazole and γ -glycidoxypolytrimethoxysilane, for example (page 9, Embodiment 10). It would have been obvious to modify '355 in view of '479 to use the claimed

amount of silane, as '067 teaches to use 0.001 to 10 wt% silane as part of the solution (composition) that uses azole-based silanes as described by '355, which would, when converted to g/L of the solution overlap with the claimed amount of silane coupling agent, and In the case where the claimed ranges "overlap or lie inside ranges disclosed by the prior art" a prima facie case of obviousness exists. In re Wertheim, 541 F.2d 257, 191 USPQ 90 (CCPA 1976). Furthermore, one of ordinary skill in the art would when optimizing the amount of silane used from the range given take into account the use of the material in the ink jet process of '355 in view of '479 and '067 to provide an amount under conditions such as viscosity to allow ink jet printing, as shown from the amount of material used as a silane coupling agent in '479 with a controlled viscosity (see paragraph [0044]). As to claims 6-7 and 9-10, '355 teaches to provide the palladium compound activator in the solution, and as to the amount of activator, Generally, differences in concentration or temperature will not support the patentability of subject matter encompassed by the prior art unless there is evidence indicating such concentration or temperature is critical. "[W]here the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation." In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955), and as to the use of palladium chloride, the Examiner takes Official Notice that this is a conventional palladium compound for activation. As to claim 8, the Examiner takes Official Notice that it is conventional to provide viscosity adjusters and surface tension adjusters in ink jet inks. As to claim 11, '067 provides the reaction product.

This is a provisional obviousness-type double patenting rejection.

16. Claims 2 and 5-12 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 5-6 of copending Application No. 10/576,230 ('230) in view of Japan 2000-204479 (hereinafter '479) and Korea 2000-0076067 (hereinafter '067).

The claims of '230 provide a teaching of a method of electroless plating where an silane coupling agent with functional group with metal capturing ability containing material is applied to a substrate, followed by electroless plating (claim 6) and a pretreatment agent (composition) with the silane coupling agent is also provided (from the composition described in the process of claim 6). '230 does not provide that the composition is an inkjet printing ink, applied by inkjet printing to form a wiring pattern; and that the silane coupling agent is an imidazolesilane but '479 and '067 provide the suggestion of these features as discussed in paragraph 6 above. As to claims 6-7 and 9-10, '230 teaches to provide a noble metal compound activator in the solution, and as to the amount of activator, Generally, differences in concentration or temperature will not support the patentability of subject matter encompassed by the prior art unless there is evidence indicating such concentration or temperature is critical. "[W]here the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation." In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955), and as to the use of

palladium chloride, the Examiner takes Official Notice that this is a conventional palladium (noble metal) compound for activation. As to claim 8, the Examiner takes Official Notice that it is conventional to provide viscosity adjusters and surface tension adjusters in ink jet inks. As to claim 11, '067 provides the reaction product.

This is a provisional obviousness-type double patenting rejection.

17. Claims 2 and 5-12 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-5 of copending Application No. 11/662,046 ('046) in view of Japan 2000-204479 (hereinafter '479) and Korea 2000-0076067 (hereinafter '067).

The claims of '046 provide a teaching of a method of electroless plating where an silane coupling agent with functional group with metal capturing ability containing material is applied to a substrate, followed by electroless plating (claim 3; although a product claim, the method steps are provided by the product by process teaching of the claim) and a pretreatment agent (composition) with the silane coupling agent is also provided (from the composition described in claim 3). '046 does not provide that the composition is an inkjet printing ink, applied by inkjet printing to form a wiring pattern; and that the silane coupling agent is an imidazolesilane but '479 and '067 provide the suggestion of these features as discussed in paragraph 6 above. As to claims 6-7 and 9-10, '046 teaches to provide the noble metal compound activator in the solution, and as to the amount of activator, Generally, differences in concentration or

temperature will not support the patentability of subject matter encompassed by the prior art unless there is evidence indicating such concentration or temperature is critical. "[W]here the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation." *In re Aller*, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955), and as to the use of palladium chloride, the Examiner takes Official Notice that this is a conventional palladium (noble metal) compound for activation. As to claim 8, the Examiner takes Official Notice that it is conventional to provide viscosity adjusters and surface tension adjusters in ink jet inks. As to claim 11, '067 provides the reaction product.

This is a provisional obviousness-type double patenting rejection.

18. The Examiner notes that the US PG PUB of 10/558,172 is US 2006/0233963; the US PG PUB of 10/586,379 is US 2008/0014362; the US PG PUB of 11/795,355 is US 2008/0138629; the US PG PUB of 10/576,230 is US 2007/0071904; the US PG PUB of 11/662,046 is US 2007/0269680.

Response to Arguments

19. Applicant's arguments filed August 21, 2009 have been fully considered but they are not persuasive.

(A) As to the 35 USC 103 rejection to the claims, applicant argues that '479 does not disclose the azole based silane coupling agent, and '067 does not disclose ink jet

printing the composition containing the azole-based silane coupling agent.

Furthermore, according to applicant, there is no suggestion to adapt the composition of '067 to the characteristics suitable for ink jet printing. Applicant also argues that the silane coupling agent in '479 has to be heated and dried, which is not required by the present invention. Applicant further argues that test data in the present applicant rebuts a showing of obviousness by showing that the comparative example silane coupling agent (corresponding to the one used in '479) has less peel strength than that of the composition of the present invention of Examples 1 and 2.

The Examiner has reviewed applicant's arguments, however, the rejection is maintained. The Examiner notes the further art provided as to various dependent claims due to applicant's amendments to the claims. The Examiner also notes the optional use of Mardilovich or Furusawa due to the amendment as to the amount of silane material used. As to the combination of '479 and '067, the Examiner is of the position that it would have been obvious to replace the silane coupling agent of '479 with the azole based silane coupling agent of '067, given that both coupling agents are used in pretreatment of surfaces before plating, and '067 teaches that the azole based coupling agent is specifically beneficial over amino based silane coupling agents (as used in '479, although '479 is not limited to such)-- with better dissolvability and plating coverage, for example. It would further have been obvious to optimize amounts and conditions to use in an ink jet process, given that '479 shows using a set amount of material with a controlled viscosity for ink jet printing (also note the further optional

use of Mardilovich or Furusawa). As to heating/drying the silane, this is not claimed. Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). Furthermore, the combined suggested is to use the azole-based silane coupling agent of '067, which would be that same as that used by applicant, and thus also not need heating/drying. As to test data in the present application, the Examiner notes that it is already suggested to use the azole-based silane coupling agent of '067 with an expectation of improved results from the better dissolvability and plating coverage. The fact that applicant has recognized another advantage which would flow naturally from following the suggestion of the prior art cannot be the basis for patentability when the differences would otherwise be obvious. See *Ex parte Obiaya*, 227 USPQ 58, 60 (Bd. Pat. App. & Inter. 1985). As well, the comparative results are only for a specific material in a specific amount with a specific metal plated over, and does not have the scope of the invention as claimed.

(B) As to the obviousness type double patenting and provisional double patenting rejections, applicant argues that they disclose using the material in an ink jet composition, and that the objective evidence of test results in this case show unexpected benefits.

The Examiner has reviewed these arguments, however, the rejections above are maintained. The further use of '067 in the double patenting rejections is provided due to the amendments to the claims. The suggestion to use the azole based silane coupling

agent in the ink jet solution is provided for the same reasons as discussed in section (A) above, and the test results do not overcome the rejections for the same reasons as discussed in section (A) above with regard to the test results.

Conclusion

20. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Katherine A. Bareford whose telephone number is (571) 272-1413. The examiner can normally be reached on M-F(6:00-3:30) First Friday Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy H. Meeks can be reached on (571) 272-1423. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Katherine A. Bareford/
Primary Examiner, Art Unit 1792